Oñati Socio-Legal Series (ISSN: 2079-5971)
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Algonormative expectations

OÑATI SOCIO-LEGAL SERIES, VOLUME 14, ISSUE 5 (2024), 1337-1358: NIKLAS LUHMANN'S SYSTEMS THEORY AND SOCIOLOGY OF LAW
DOI LINK: HTTPS://DOI.ORG/10.35295/OSLS.IISL.1864
RECEIVED 27 SEPTEMBER 2023, ACCEPTED 27 NOVEMBER 2023, FIRST-ONLINE PUBLISHED 7 FEBRUARY 2024, VERSION OF RECORD 1 OCTOBER 2024

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Abstract

Contemporary society has developed, for itself, a way of reducing its own complexity: algorithms. Their basic function is precisely that of reducing the complexity of expectations – cognitive and normative – and those of the expectations of expectations (juridical decisions). When observed under this lens, algorithms, by way of their artificial communication, equally influence normative expectations (Luhrmann) and juridical norms (Hydén). In this article we will attempt to respond to the following question: is it possible to defend the existence of algonormative expectations? In order to respond, methodologically, one seeks to define in what way the employment of the theories of these authors contribute to the development of the concept of algonormative expectations. It is in this direction that one initially approaches Hydén's bases for algo norms and, at a second stage, one seeks to conjugate them with Luhmannian cognitive expectations. The final question is to verify, alongside the artificial intelligence defended by Esposito, what the conditions are for the observation of algonormative expectations.

Key words

Algonorms; normative expectations; algonormative expectations; algorithms; law system

Resumen

La sociedad contemporánea ha desarrollado, para sí misma, una forma de reducir su propia complejidad: los algoritmos. Su función básica es precisamente la de reducir la complejidad de las expectativas –cognitivas y normativas– y la de las expectativas de las expectativas (decisiones jurídicas). Observados bajo este prisma, los

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algoritmos, a través de su comunicación artificial, influyen por igual en las expectativas normativas (Luhmann) y en las normas jurídicas (Hydén). En este artículo intentamos responder a la siguiente pregunta: ¿es posible defender la existencia de expectativas algonormativas? Para responder, metodológicamente, se busca definir de qué manera el empleo de las teorías de los mencionados autores contribuyen al desarrollo del concepto de expectativas algonormativas. Justamente en esa dirección se abordan inicialmente las bases de Hydén para las algo-normas y, en una segunda etapa, se busca conjugarlas con las expectativas cognitivas luhmannianas. La cuestión final es verificar, junto a la inteligencia artificial defendida por Esposito, cuáles son las condiciones para la observación de expectativas algonormativas.

Palabras clave

Algonormas; expectativas normativas; expectativas algonormativas; algoritmos; sistema jurídico

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1. Introduction

Algorithms form part of the evolutive acquisition of complex societies, however they are nothing new. Their first historical registers go back to Ancient Greece, with the discussion by Euclides, or Eudoxus of Cnidus, on the oldest algorithm known until now (Aho *et al.* 1974, pp. 300–302). The Egyptians and Babylonians used it (Bullynck 2015, p. 335) and, later, to resolve diophantine equations linked to Astronomy and to the calendars, algorithms were newly invented in China and India. Esposito (2022, p. 3) reminds us that the etymology of the term *algorithm* derives itself from the Persian mathematician, "Al-Khwarizmi", from the ninth century.

From the time of their conception, therefore, in a fairly direct way, algorithms can be understood as guidelines in order that a task be performed. They are constituted by mathematical structures destined towards the execution of pre-defined patterns – for example, as norms and, among them, in Hyden's perspective, juridical ones.

Algorithms are fundamental to the science of computing and, in the modern sense, are also essential for society and for Law. Algorithmic means of communication have gained a greater presence across social systems. They are naturally present in the legal system, provoking, by way of cognitive opening, reactions that adapt them for legal *input* and, in happening this way, preserve the functional differentiation of the juridical system.

By the processes of the absorption of external elements to the legal system (cognitive opening), one can verify how algorithms, specifically those applied to machines (in the science of computing), become the supervisors of behavior as "masters". Without them, contemporary society loses itself in a complexity that is difficult to minimize, even when it comes to normative expectations.

Algorithms exist to resolve various problems. When one relates the subject to the internal operations of the legal system, there are innumerable examples of how algorithms come to influence decision-making, organizing processes and, as well, processes for the internal operation of the system. Algorithms calculate the execution of the sentence, modulate judicial decisions, move trials along, besides adding a curve to other functions. Algorithms, already internalized and ready for *output*, act from an embedded system outwards into systemic interconnections.

When one speaks of the ties between Law and Algorithms, the question centered on the possibility of the influence of the former over the latter is relevant because it needs, in the perspective of Luhmann's social systems theory, the development of an observation that accepts that artificial communication (Esposito) will permeate the relationship between a normative expectation and a juridical norm.

This article plans to respond to the following question: can the influence of algorithms in Law make it possible to justify the existence of algonormative expectations? Initially, it is necessary to verify three steps: (a) to observe how normative expectations (Luhmann) and algo norms (Hydén) relate to each other to thereby introduce the idea of artificial communication (Esposito) (b) to rigorously examine under what conditions one could take a normative expectation into account at a moment when it would be possible to (c) adopt an algonormative expectation as a concept.

2. Normative expectations and algo norms

All theory is self-defined. Theories have limits. Luhmann's own theory of social systems has criticisms that range from a possible inability to capture legal rationality to, for example, the removal of human beings from the centrality of society. The criticisms are well summarized by Moeller (2011), for whom the radicality of Luhmannian thought – and his "scandals" – seeks to overcome Enlightenment human centrality and anthropocentrism through the construction of a social reality as an effect of the autopoietic contingency of the system. of society. It is true, however, that much can also be learned from different theoretical frameworks.

The thesis of their being grounds for combining algorithms with norms has been defended by Hakan Hydén (2022, p. 273) and will be used to defend the concept of algonormative expectations. In this sense, the author's approach to *algo norms* requires the observation of the algorithm as: "technical design that addresses what to do and a societal construct with consequences for society (or part of it), what I call *algo norms*".

The concept of algonorms developed by Hydén sets out from its conception with respect to the Sociology of Law as a science of norms and possesses, without being able not to, differences in relation to Luhmannian theory. The idea of society as a norm defends that juridical norms are those norms that gain determined characteristics for being socially recognized as juridical norms (Hydén 2022, p. 131). For being elevated to such a category, they win the backing of the State to be abided by in the case of violations.

Different norms exist alongside various types of normativity. Norms occupy a centralized position in society (Hydén 2022, p. 13). The variability of systemic conditions would be in a symbiotic relationship between society (sociocultural elements, technology and economy) and biotic factors, nature and physics. The latter possess a non-automatic impact on the former which, in turn, automatically impacts them.

These systemic conditions act directly on the possibilities by which norms relate to each other, such as types of norms or which of the norms should be applied to certain types of conduct. Norms, however, are still influenced by forces such as Power, Economy, Religion, among others. Cognition, the knowledge of norms, originates in experience, competence, tradition, and education, among other factors.

It involves quite complex observation. For Hydén (2022, p. 16) "norms generate guidelines for how to act to achieve or reach a certain goal or value". Therefore, norms can have various characteristics, even becoming judicial by common understanding. However, they will always find their origins in a quite sharp interactive complexity. It is a question of normativity being based on the cognitive:

> The type of normativity that I discuss here manifests itself practically within the framework of professional knowledge systems. The natural sciences lay the foundation for technical applications, where engineers in different fields follow prescriptions for action, which derive from a delimited norm system tied to a knowledge system about a naturally defined phenomenon. (Hydén 2022, p. 16)

It will not always be possible to foresee behavior, since norms originating in a determined system can have an effect one on the other. They could even collide with social values. When this is the case the State intervenes, most of the time, with the use of juridical norms. Knowledge (cognition) in these cases "works and has the same function

in interpreting technical norms as the preparatory work behind a law has for lawyers when the lawyer seeks to understand the content of a law" (Hydén 2022, p. 16).

It seems quite clear that the idea of system differs between Hydén and Luhmann. While Luhmann applies a binary code as a theory to determine what belongs to each system, Hydén (2022, p. 109) adopts an empirical approach, attributing similar characteristics to certain systems. Such characteristics, when they unite themselves with norms, come to have a decisive role in society. When norms stay synchronized to actions, there is the creation of social systems in action. These actions can be considered as sociocultural phenomena, politics, economics or ecologically. One system is manifested when individuals articulate the content of systems or when an individual is affected by the system.

There is an additional difference in the thought of the authors when one observes how each of them observes complexity. Hydén agrees that Law can be observed as a mechanism that reduces the complexity of what he calls social events. In his own words:

> I agree that law can be seen as reductive in relation to the complexity of social events. When the law encodes the social problem and translates it to its own language, this entails by necessity a degree of simplification given all the possible interpretations of the event. Each system interprets and describes the same event in different ways. The patterns according to which society's various subsystems are constructed create different, paradigmatic structures of understanding. (Hydén 2022, p. 164)

Nevertheless, Hydén expands such reasoning to point out how Law, upon being observed as a norm and, more precisely, a juridical norm, trims out specific parts of reality in a determined course of events, lending to them relevance from judicial understanding, at the same time that other norms neglect such a fact. Complexity, therefore, resides in the fact of Law defining the problem in agreement with its perspective. In other words: real complexity comes to be substituted by juridical complexity.

This algorithmic society holds as its great promise the reduction of complexity, creating a "modeled" freedom, setting out from the phenomenon of cyber culture that has been described by Lévy (2010) and the massive use of digital media to resolve daily problems by way of algorithms. In the language of Covas (2019), it is to manage uncertainty and reduce insecurity. Algorithms present themselves as cognitive protheses, true filters for the higher levels of contingency in contemporary society.

It is important to highlight that, for the Swedish author, there are different orders of normativity. One essential point is when one perceives the algorithm as a technical instruction; another equally important feature involves the combined consequences of this. They are distinct moments to be exemplified in the following way:

> … it is one thing to know when a person should be sentenced to imprisonment and another to understand what this means for society, the perpetrators, or for the victims of the crime. These are different spheres of knowledge, which require their own different methodological approaches. (Hydén 2020, p. 412)

For Luhmann (2016, pp. 102–103), the juridical system has reached adequate complexity, as has been referred to before, in an observation of second order. The problem, therefore, in our consideration of Hakan's idea of diversity in normativity, is that the nucleus of

the discussion tends to be the following question: how does one qualify a normative expectation that includes algorithms?

Luhmann (1995, p. 44) points out that a second order observation directs itself towards circularity. It is the observation of itself. Observation of observation. Circularity will generate contradictions and two forms of self-description by the system: (a) tautology (what the system is) and (b) paradox (what the system is not). In a very simple way, one can say that first order observation is an observation of one system over the other, while second order observation occurs when a system observes itself.

In Law, in second order observation, there is a normative observation in judicial communication. For an algorithm to condition self-observations: is it or is it not in agreement with the Law? Is the Law to be maintained and imposed? Will there be the application of a sanction to an end that expectation will act in a way for Law to be maintained?

These questions are related to a second order observation by the judicial system, quite similar to the concept for various levels of normativity. Accordingly, the adequation of the fact to the respective norm is differentiated. The eventual sanction is a phase different from that where the consequences of a juridical decision are observed.

In any case, second order observation assumes that the system of Law is capable of assimilating. Capacity for assimilation. How? In a cognitive context. Hetero-reference. This opening of the Law consists of a predisposition for the learner and it is precisely there that reside inter systemic relationships that in social systems reach their potential through communication, including the ones that Esposito (2022) describes as transhuman.

Bora (2012, p. 138) states that Law possesses the capacity to assimilate as long as it can react, internally, to low performance in its programming (legislative politics). In other words, the utilization of algorithms as an internal reaction of the Law for its programming problems, especially those derived from complexity inherent in a global social system, means algorithms + norms. Algonormativity.

It is for this reason that the concept of *algo norms* developed by Hydén (2022) takes into consideration the diverse levels associated with the judicial system's observation, making it clear that its definition is linked to "second order calls", that is, to the social effects caused by the use of algorithms in judicial decisions. In the words of the author (Hydén 2020, p. 412): "*algo norms* are those norms related to the societal consequences that follow the use of algorithms in different aspects".

Even though the differences pointed out exist, on cannot deny that the concept of *algo norms* acts upon that which one expects from juridical norms in a certain context. There is also the fact that Hydén (2020, pp. 412–413) defends the idea of similitude of algorithms being observed from their technical terms and based in Law. Both are normal. It does not therefore become difficult to connect *algo norms* with normative expectations to the end of defending the concept of algonormative expectations.

In the case of Luhmann's systems theory, this affirmation becomes more relevant still because of its descriptions being peculiar to the traditional sociological context. In this sense, Moeller (2011) indicates that among the "great scandals" of Luhmannian thought

one finds the displacement of the position of the human being. In the expression used by this author, it is a matter of anti-humanist radicalism insofar as Luhmann frees himself from platonic mind/body dualism and from the centrality of the mind in the Cartesian vision. This is a useful presupposition to provide answers to what surrounds the existence of algonormative expectations.

Human centrality in traditional sociological analysis, as such, is substituted by communication, a distinct element in social systems (Luhmann 1997). The human being's psychic system plays a role in permanent, yet independent, interaction with social systems. In other words, communication occurs without the human being, as transhuman and artificial communication defended by Esposito (2017). However, society does not exist without communication.

Under this perspective, machines (computers) communicate with each other by algorithms, as in the example of *machine learning* as an auxiliary mechanism for resolving repetitive demands. The argument developed here matches such an assertion. In this way, computers that use *machine learning* algorithms communicate – and communication occurs with respect to previous communications, albeit artificially (Esposito 2017, p. 261).

In order to take this complexity head on, Luhmann's theory of social systems proposes to simplify it, performing a function identical to that of algorithms, through the conception of cognitively open and operatively closed systems. The opening consists of an element linked to the capacity of acquiring knowledge, to absorb external influences (learning); closure to preserve particularity (functional differentiation). Law and Computers (machines), therefore, do not escape the need for codes, programs, self-organization and self-reproduction to characterize themselves as functionally differentiated and autopoietic systems.

Expectations (Baraldi *et al.* 2021, p. 95) are condensations of sense that demonstrate the constitution of certain situations and what we can expect from them. The function of expectations is to provide a relatively stable orientation for communication and thought, even if the alternative of choices – possibilities – presented to human sense is greater than our capacity to understand.

In this way, as Baraldi *et al.* (2021, p. 95) remind us, expectations are structures of social systems as well as psychic systems because they establish the selectivity of these systems and ensure a horizon of possibilities understood as expectation of expectations. In this way, a system observes external communications as uncertain ones. This uncertainty is internally reprocessed in a way for the system to be able to understand. As a result, the uncertain expectation becomes a way of orientating the system itself.

The structure of a normative expectation differs from a juridical norm. As Luhmann tells us (2019, p. 56), a normative expectation is only accessed by way of a process of double generalization. On the one hand, there exists the hope of the expectation, for one should observe the conduct of the other as contingent. With this there is more complexity to come; from the other part, the distancing of facticity provides transmissions and projections. It is about the normative formulation of the expectation, that which one can expect (symbolic activities and sanctions).

From this reasoning, to determine what characterizes a normative expectation is an arduous task, since "at specific levels, cognitive and normative expectations are blended together and cannot be clearly separated" (Baraldi *et al.* 2021, p. 98). However, as the authors themselves point out, the conditions for a cognitive expectation to be stable should be generalized separately.

In this perspective, in agreement with Luhmann (1971), normative expectations, in the hypothesis of disappointment, are fulfilled, meaning that the violation of a norm and its respective sanction create the path for normative expectations to be established. On the other hand, cognitive expectations are those in which, when disappointment occurs, adaptation to reality is possible, since there exists an (un)conscious predisposition towards assimilation.

This is the reason why Luhmann (1971) considers cognitive expectations as predisposed towards learning; normative expectations, on the other hand, are not. Cognitive ones are differentiated and institutionalized by way of Science, while the latter are processed through Law.

Hydén (2022, p. 101) reminds us that a normative expectation involves how an individual behaves in a determined context, while a cognitive expectation is the modality of expectation in which an action – or another condition – will occur based on the knowledge someone has about related conditions. The author gives natural law as an example of cognitive expectations.

Hydén (2020, p. 101) states, furthermore, that in the case of disappointment of a cognitive expectation, one acts to adjust the expectation. The contrary is not done. However, in the case that a normative expectation fails in its performance, various reasons as to why it should be maintained exist, by way of sanctions and/or other measures – as a rule, coercive.

For this reason (Baraldi *et al.* 2021, p. 98), in the case of normative expectations, the difference between compliance and disappointment corresponds to acting in conformity with the expectation or, on the contrary, acting in discordance with the expectation. According to the same authors, when it comes to cognitive expectations, the difference between compliance and disappointment occurs between knowledge (compliance) and not knowing (disappointment).

Thus, based on these elements, the article comes to focus, introducing Esposito's idea of artificial communication, on the possibility of an algorithm influencing a normative expectation. In the case of the answer being positive, one thus opens the door to be able to talk about algonormative expectations. In the reverse situation, when the answer is negative, the defense of this new mode of normative expectation (algonormative expectation) becomes hampered.

3. Can algorithms influence a normative expectation?

As has already been referred to, it is necessary to remember that communication constitutes a singular characteristic of social systems (Stamford 2021). Ultimately, therefore, society is purely and simply communication. However, here there is an interdependent relationship between individuals, for they are not able to exist – and

continue existing – without social systems. In the same way, social systems cannot emerge without people (Luhmann 1984, pp. 45–60).

In Luhmannian observation, communication is the result of three distinct levels of selection. These are namely the following: (1) the selection of information, that is, what will be communicated; (2) the selection of utterances, being the way in which information is standardized by external observation; (3) the selection of (in)comprehension (Schwartz 2013, pp. 62–63), what in other words consists of the (re)configuration of various possibilities with respect to which occurs the interpretation of communicative units.

For this reason, communication is not confused with conscience. Even though the latter is the presupposition of the former (Guibentif 2012), communication only occurs when it is possible to distinguish information from the utterance (Luhmann 2002, p. 157). Perception, therefore, is a characteristic proper to psychic systems (Luhmann 1997). It is a matter of a psychological phenomenon, not externalized, that is invisible to communication. In this sense, it is only from specific selections that the content of perception can be perceived as communication.

This is how Luhmann understands communication as improbable (Luhmann 2006), since it cannot be understood as a (re)duplication of utterances in another conscience. For alter to understand the ego and have a message successfully arrive at the receiver is a highly improbable task. Communication, therefore, is not confined to transmitting certain content. The central question is about how social systems provide communication to each other in an autonomous way in relation to the conscience.

In view of what is being proposed here, for an algonormative expectation to exist, it is necessary to recognize the capacity for algorithms to communicate. If it is accepted that they communicate this means that the concept of Luhmannian communication, in contemporary society, will possess a third element that is not human (artificial).

Reinforcing the argument put forward, algorithms are present in the communication of the contemporary social system. Omnipresent. Indispensable. They constitute themselves as social agents (Esposito 2017, p. 249) and, according to the author who proposes this, become players in the communication of social systems. They produce artificial communication:

> By artificial communication I mean communication that involves an entity, the algorithm, which has been built and programmed by someone to act as communication partner. It is artificial because you communicate with the product of someone without communicating with the person who produced it. (Esposito 2017, p. 261)

For now, it is fitting to agree with the author on the fact that the existence of communicative capacity by way of algorithms is possible. The assumption still needs to be placed before the already mentioned characteristics of normative expectations for it to be possible to affirm the existence of algonormative expectations. In this aspect, Hydén defends that:

> Thereby, Luhmann emphasizes the independence of the systems and their influence on social progress. He predicts both the normative progress that will follow in the wake of artificial intelligence (AI) and that algorithms will become norm-bearers without visible subjects. (Hydén 2022, p. 89)

Nevertheless, if an algorithm can communicate, it would be, once again, before a vision that refutes anthropocentrism and that appears to ally itself with a great sociological "scandal" (Moeller 2011): the aforementioned repositioning of the individual in society. In other words, an algonormative expectation, similar to a normative expectation, repositions the role of algorithms towards the question of communication.

3.1. Can algorithms influence the capacity for assimilation of Normative Expectations?

Normative expectations possess the capacity for assimilation. Thus capacitated, can they in turn influence such a characteristic? Taking into consideration that algorithms, as much internally (operational closing) as externally (cognitive opening) make themselves omnipresent in the communication of the global social system (Stichweh 2019), it cannot be denied that they have a potential to influence normative expectations. Since they could influence this way, one could begin to speak of an algonormative expectation.

The assimilation of external communication by the legal system follows the process of functional differentiation of all social systems. It means that the first distinction originates in the relationship between system and surroundings. This consists of the basic distinction from which all others occur.

Social subsystems surround each other and are set in an interdependent relationship. Intersystem communication (Febbrajo 2013) is present as a way of perturbing the order of each social system. The big question comes to be how to obtain order from this perturbation (Teubner 1990). In the case of Law, external communication tends to threaten its function: the maintenance of normative expectations.

From this point, therefore, there is a necessity: to be recognized as existing, algonormative expectations need to be observed within the context of functional differentiation of social systems and as an integrating element of intersystem communication. Before analyzing how the legal system assimilates the noise of surroundings, it becomes necessary to confront the communicative capacity of algorithms.

In this approach, Esposito's thoughts (2022) regarding the artificial (transhuman) communication that algorithms produce is applicable to the concept of algormative expectation. Why? Upon producing communication artificially, as partners, algorithms perturb and are present, in one way or another, in intersystem communication. And, if this notion is correct, the consequence is that algorithms influence normative expectations.

Esposito (2022, p. 1) is still quite uncertain about the thinking capacities of algorithms. However, what remains quite clear is that they, based on *machine learning* and *big data*, participate in communication in the function of partners. Their argument is that there is direct dialogue with algorithms, be it when there is conversation via *WhatsApp* with some robot from a shop that serves us or, still, in the hypotheses in which Google tends to direction us for answers to searches.

The reality of this daily communication leads our questioning to consider whether machines think, which would lead to other further developments. Esposito (2022, p. 3) defends that we are not seated in front of something "intelligent"; however, we must

consider the communicative abilities that algorithms, the protagonists of the current communicative revolution, provoke in communication as a concept.

The fact that algorithms (still) do not think, performing orders for determined functions, constitutes the emphasis that their effect on social systems is centered on communication. Undeniable is "their ability to act as partners in communicative practices that produce and circulate information, independent of their intelligence" (Esposito 2022, p. 5).

The subsequent question, therefore, is if psychic systems manage to communicate with algorithms. On this point, Luhmann's concept of communication, developed previously, becomes relevant because it does not include the thinking of the participants in communication. This may bring one to challenge the affirmation that machines do not think, even though they can communicate by algorithms.

In this sense, Esposito (2022, pp. 10–11) works the concept of virtual contingency to explain in what way algorithms can be partners in what is named artificial communication. This virtual contingency is "the ability of algorithms to use the contingency of users as a means of acting as competent communication partners". On the one hand, the contingency of a machine is simply the contingency of the user. On the other hand, what users observe in cases of machines that learn is the observation of others; as what happens when a film is suggested to someone based on determined patterns of previous observations pertaining to others.

But where are the algorithms capable of finding the contingency that they themselves reflect to the end of having access to their partners in communication? The answer given by Esposito (2022, p. 10) is the *web*. In fact, putting forth Google as the grand example, algorithms manage as much to verify if someone is acting in accordance with or against the Law in social networks as when, for example, they interact in the modulation of product choice. As the author tells us):

> Algorithms make selections and choices based on criteria that are not random, instead reflecting and elaborating upon the indeterminacy of their participants. Users receive contingent responses that react to their contingency using the contingency of other users. While they do not directly communicate with this assortment of other users, the result of this interaction is a specific answer to a specific question which would not exist if other users were not also engaged in communication. (Esposito 2022, p. 13)

Thus, if there exist interactions with algorithms that learn, we are talking about artificial communication (Esposito 2022, p. 14). Since such a connection really exists, Luhmann's concept of communication becomes quite appropriate for observing how such interaction affects social systems. In certain cases, this communication, in its artificialness, influences Law's capacity for assimilation.

Law assimilates external influences by means of its code (*Recht*/*UnRecht)*: its own binary scheme. Guaranteed, thus, is its processing of information for its specific reality at a given instance. Third party values are excluded, there being a logical treatment enabled by high technical content to make observations between the two sides of the code viable, coming in the end to form a unity. Law is the unit of difference between *Recht* and *UnRecht*.

Having excluded third party values, there are still all those communications that have not been assimilated by the binary structure of the code, where there is, invariably, (a) a positive (or designative) value, a translator for the communicative capacity of the system and (b) a negative value, without designation, that reflects the contingency of the insertion of the positive value in the context of the system (Luhmann 1993, p. 92).

On all occasions that the issue of the *Recht*/*Unrecht* code is raised, one speaks of the system of Law. It is the code that facilitates the recursive operations of the system, the function; and abiding by its mechanism. It is the function, the maintenance of (algo)normative expectations, that functionally differentiates the subsystem, defining operational closure.[1]

Therefore, the unit of difference provided by the Law's binary code permits the assimilation of external communication: this preserves the autonomy of the legal system. The maintenance of (algo)normative expectations depends on processes of forced selection that exist in the interior of the juridical system.

The consequences are that they will be distinct in each process. In the legal system it becomes clear that situations that are in disagreement with *Recht* will produce reactions, even if, by tautology and redundancy, *Unrecht* is (re)known as part of the operational processing of the legal system.

In view of this, all communication (the artificial as well) existing in the environment will only be assimilated by Law from its own proper and exclusive criteria configured by a specific code (Luhmann 2016, p. 93) that attributes them with a form and a closure. Therefore, all or whatever communication, algorithmic included, is treated by the functional differentiation of Law and will be juridically relevant (or not relevant) by the processing of Law itself.

In other words, algorithms influence the capacity for assimilation of the legal system and need a double forced selection. The first one, the external one, is given by the previously described movement, passing through the filter of the code, to know what is juridically relevant to remain in the system of Law. The second is internal, due to the fact that algorithms are also used in Law's operational closure whilst elements of selection of communications pertaining to the legal system.

3.2. Do algorithms influence judicial proceedings?

The question of algorithms' capabilities in influencing judicial proceedings arises to observe in what way – and in what type of observation (first or second order) – this can occur. Normative expectations adapt themselves to reality through procedures. As Bora states (2012, p. 137), in Law it is by means of normative expectations that the future is constructed, "where present futures gain expression, now, however, not in the form of utopias, but demanding defined behaviors in relation to the state of things". It is the sanction that confirms the initial expectation.

In this sense, judicial procedures can be understood as:

> organized and empirically understandable systems of performance, being able to be orientated not only by way of juridical decisions, but also by institutionalized social

[1] Term in the literature of Maturana and Varela.

> exercise and, finally, by the expectations in behavior that are circumstantially generated by this. (Luhmann 1969, p. 52)

By "permitted conflict" (Luhmann 1969), the judicial procedure permits situations in which the expectations of one case with respect to the same juridical norm can be totally contrary to the other. The conflict becomes institutionalized, and the maintenance of expectations will be dealt with by the legal system. How? By the aforementioned use of the sanction.

One can also understand judicial procedure as a series of rites destined towards a determined end (decision). Its function is to specify the nature of discontent (which can be accentuated by the vast uncertainty surrounding the result of the trial). The psychic acceptance of decisions on judicial procedures rests, therefore, on a double contingency: the expectation of the expectation. Such complexity is still greater when a third element presents itself in the decider, who, in turn, setting out from his expectation, will decide based on the expectation of the expectation.

For this reason, judicial norms are a form of generalization from where it is possible to tolerate the real as contingent: even "winning", the party may not accept the result and appeal. The same for the one who lost. Juridical norms offer a vision of reality contingent and open to diverse possibilities:

> In a certain way, normativity of structures seeks internal reassurance for a relationship with contingently projected reality. Thanks to a structure of reciprocally normative expectation, people can interact even when they see themselves as obliged to see and concede that their conduct is not understood by they themselves. (Luhmann 2019, p. 59)

Keeping in mind, therefore, that juridical norms strengthen contingency, and that judicial procedure seeks to reduce this complexity, it becomes psychically acceptable, by way of operations and the decisions they produce, to add the virtual "partner", the algorithm that does not think (Esposito 2017, p. 255). It works as an element to reduce complexity, even when virtual contingency occurs.

The presence of the algorithm in (judicial) communication consists of a type of artificial communication that, according to the author (Esposito 2017, p. 261), is a communication that envelopes an entity – by the name of algorithm – created and programmed by someone who grants it the destiny of becoming a partner in communication. It is artificial because it communicates with the product of someone without the existence of communication with the programmer.

In fact, it is impossible to teach an algorithm to think (Esposito 2017, pp. 261–262). However, a *learning* algorithm can use various inputs to determine the best solution such as, for example, the distribution of a certain trial in a court system. With various interactions originating in users, the algorithm does not become more intelligent. It functions better, in a faster and more efficient way. And, of course, it reduces complexity.

The same reasoning can be applied to the development of algorithms: artificial intelligence applied to the Law. To cite just a few cases, one localizes, along the spectrum, algorithmic submission of the employer in relation to a chief-algorithm (uberization of work); the judicialization of *fake news* communication that has sprung up and (re)doubled by robots armed with algorithms. Parallel to this, communication is no

longer exclusive to social systems. To varying degrees, of course depending on the perspective of the observer, communication develops a new meaning for itself.

As a result, algorithms do indeed influence judicial proceedings, reinforcing the thesis for the existence of algonormative expectations. For this to receive further consideration, it is necessary to understand whether or not algorithms are capable of influencing in the compliance/disappointment of normative expectations.

3.3. Do algorithms influence in compliance/disappointment of normative expectations?

In a text that deals with the paradoxes of Human Rights, Luhmann establishes a thought that is quite well known to legal dogmatics (Luhmann 2018). Human rights are only reinforced, or (re)affirmed, in the measure that they are violated – therefore, when they are not obeyed (Luhmann 2000, p. 158).

From the point of view of judicial dogma, seeking, for example, the approach by Kelsen (2009), the judicial norm constitutes a source of validity from all other norms pertaining to the same ordering. Under this perspective, the norm that simply stipulates a certain conduct is named as secondary, since the primary norm is the one that imposes a sanction in the case of non-compliance.

From this it follows that juridical dogma imposes as essential the figure of the sanction to reaffirm the norm itself. Therefore, for a norm to be just or unjust lies in the interpretation of conduct. In the case that it is in accordance with the norm, it is just; if the case is contrary to this, it is unjust.

In light of juridical dogma, for example, according to Ferrari (2020), the presence of an algorithm would not alter the mentioned formula, *If = Then* still being the case. In other words, if a certain conduct violates the norm, there should be a sanction; if the reverse occurs, no sanction applies. Algorithmic programming, then, would only aid in this reasoning. The fact that the original programmer is a person or algorithm would not influence the result:

> All of this is traced back to the original project of the programmer, who can be both a flesh and blood subject and an algorithm capable of self-correcting and self-programming, as happens precisely with artificial intelligence and advanced robotics. The space-time of the decision coincides with the infinitesimal instant necessary for the procedure to take place. (Ferrari 2020, p. 15)

On this point, it remains quite clear that algorithms, from the perception of juridical dogma, are capable of aiding in the application of the sanction. This means they perform in (re)affirming the norm and can, for example, calculate sanction. There are numerous examples related to this (Ebers and Navas 2020). To cite a few: (a) decisions to exclude certain profiles on social networks based on certain patterns; (b) automated decisions in terms of intellectual property before the possibility of recognition of standards that violate such a right; (c) calculation of civil indemnities; (d) jurisprudential "decision-making" algorithms based on recognizing decisions in a repetitive mode.

From the point of view of Luhmann's systems theory, legal dogma is found in the interior of the legal system and connected to its code and to its programming. It allows for an undeniable point of departure. One cannot deny that the interpreter sets out from

certain materials (Luhmann 2018, pp. 29–31). Normally, they are juridical norms. Then, insecure elements for the eventual decision become simplified between the material and its concept.

At what stage of this construction would the algorithm enter as a communication to influence the eventual judicial decision and, therefore, the consequent sanction? In as much the material form as a concept. "Decision making" algorithms, made for learning and based in their concepts, possess the characteristic of extracting and analyzing material across diverse judicial procedures such as those cited.

Legal dogma presumes a certain level of organization from the juridical system, especially the fact of being able to take decisions linked to concrete cases (Luhmann 2018, p. 31). In this sense, dogma defines, inside this inclination, what is juridically possible or, in other words, the construction of legal cases.

In a society of unceasing (complex) communication, dogma, that governs juridical knowledge (Luhmann 2018, p. 45), remains exposed at elevated levels of uncertainty for legal cases to be (re)affirming for normative expectations. The stabilization of normative expectations, therefore, constitutes itself in a moment at which disappointment needs to take into consideration that variability does not make the arbitrariness between system/environment possible. In other words: the fixation of determined criteria suffers from the influence of communicative processes. Algorithms, at this point, especially those capable of learning, become communicative partners in the process of (re)affirmation of normative expectations.

As has already been referred to, algorithms become rather useful in the reduction of complexity for the operative status of the judicial system. The frustration inherent in legal procedures also consists of frustration from normative expectations, and the way of dealing with this double frustration is, paradoxically, to observe that the violation of the norm is its (re)affirmation.

> Just as, frequently, expectations become conscious by way of their frustration, it is this way for norms as well because of their being frequently offended. In systems that process information, the situation of frustration leads to the reconstruction of their own past, to recurring processing, with rescue and apprehension over what at the time is relevant. (Luhmann 2000, p. 158)

At this point, it remains quite clear that algorithms can influence in the compliance/disappointment of normative expectations. It is not only a matter of a dogmatically but temporally adequate decision (algorithms being capable of accelerating decisions), but also consistent with the formula of Justice contingency.

The formula for contingency, Justice, in the system of Law, is placed by distinctions (Luhmann 2016, pp. 290–291). It is self-referring while observing, however not as an operation. In the same way, it is related to the programming of the juridical system and not with its *Recht/UnRecht* code. And, further still, it does not present itself as a theory but as a norm, one that is prone to frustration.

It cannot be confused. Justice is not a specific program, a selection criterion. Justice is a representation of the system inside the system. If it were observed as a selective criterion, it would lose its function. One must therefore understand that the justice norm does not possess predictive capacity. Besides, the internal operativity of Law is more aligned with

what one expects to be Justice, independent of its set of norms. From that point the existence of unjust decisions is absolutely reasonable, even those from unjust juridical systems.

Evidently, algorithms do not possess a contingency formula by the name of Justice, being able to, however, use it in their programming. Their strategy to deal with contingency is their own formula. In a certain way, therefore, one can affirm that judicial decisions based on algorithms utilize an algorithmic formula – classified for self-reproduction by *learning machine* – to operate under the format of the formula Justice contingency.

The way by which the cited algorithms are programmed to perform their artificial communication, to take decisions and decisions with respect to other decisions (jurisprudences), they notably influence the compliance and disappointment of normative expectations.

In the system of Law, the Justice contingency formula ought to be preserved and, as such, its operativity utilizes algorithms as much for reducing complexity as for increasing it (when it is possible to decide on a greater quantity of cases). In this sense, a juridical decision based on algorithms that seeks to establish normative expectations will need to connect itself with Law's contingency formula (Luhmann 2016, pp. 316–317), which, by itself, is already a demonstration that, yes, algorithms influence the compliance and disappointment of normative expectations.

Under this perspective, with the positive response to the question poised in this segment of the article, the construction of algonormative expectations persists. The next doubt to clarify is whether or not algorithms modify the future of normative expressions of the legal system. This is what the following item will approach.

3.4. Do algorithms modify the future of normative expressions?

Luhmann's theory of social systems presents itself as a sociological theory that is more orientated towards the temporal aspect of Law rather than the normative aspect – what is anchored, for example, in the position of normative expectations. In this sense, to understand how algorithms can modify the future of normative expression configures itself as the last stage to affirm the existence of (algo)normative expectations.

The temporal function of the juridical norm is in the relationship between expectation and the expectation of the other with respect to it. The eventual decision (even in those decisions that utilize algorithms) needs to take into account the reduction of this complexity, keeping in mind its counterfactual character (Luhmann 1983, p. 57).

To arrange the eventual reaction in an anticipated form is a strategy linked to anticipating the future and, at the same time, minimizing the risks. The maintenance of the following contradiction is what gives support to this statement: if disappointment consists of a probability, its occurrence, be it detrimental or beneficial, depends on the point of view of the observer.

The temporal observation of the system of Law is distinction. Without the position of a privileged observer or of an ultimate observer, there exists a secondary distinction that has to do with time: its self-contradictory condition of advancement, based on shifting or unchanging phenomena (Luhmann 2007, p. 714). It is more understandable that what is unchanging can be observed by the observer since a new observation is unnecessary.

Discovery does not exist. What one can change will only change because of the existence of the unchangeable.

As referred to previously, judicial dogma remains imprisoned in the past. A previous, past behavior is necessary to apply, in the present, a law that was also made previously. Jurists relate to each other with this temporal scheme in quite a reasonable fashion. It is because jurisprudences, doctrines and decisions that are juridical by nature make it impossible for the future to occur. The use of algorithms therefore could, in this type of observation, reinforce the future of the past.

Time is a succession of continuous events connected between operations and structures for the happening, in Law, of the judicial system's function: the maintenance of normative expectations. Along this line of reasoning, it becomes necessary to enquire about the point at which algorithms can influence the (future) temporality of Law.

There exist two ways for temporalization in the judicial system (Luhmann 1997, pp. 557–565): (a) normative validity and (b) complexity. The question of complexity was approached in the first item of this article. Nevertheless, when one speaks of the first, normative validity, one has it that juridical norms are based on their temporal projections. This means that they are provisional and contingent. For this reason, the juridical system maintains the objective of a certain future, (Luhmann 1997, p. 559), distinguishing the probable from the improbable and abandoning naturalist and/or positivist orientations.

In this sense, normative expectations assume, once again, a great importance. The variability of the juridical system is an intrinsic characteristic for its operation. The juridical system itself possesses mechanisms of temporal variation and risk propagation. A contract is a clear example of this argument since lack of trust in the consequences of future violations of its clauses gives foundation to the present trust of the parties.

This futurization of Law, according to Bora (2012), is related to how the juridical system also finds a juridical and specific form to decide on the indeterminacy referred to. Algorithms accompany this task. Some indications can be found in the assumptions given by Luhmann (1997, pp. 562–564) in relation to the way in which the system exercises its functions before its original uncertainty:

1. the function of the maintenance of normative expectations is directly related to the social costs of its temporal links, not being necessary for such deadlines to become a part of the juridical norm. In this way, when algorithms perform in the social costs referred to in temporal binding, as, for example, diminishing the time for judgement of cases, there is clearly performance to diminish time spent and one can defend the existence of algormative expectations;
2. juridical validity is dynamic and is based on circularity in the juridical system, which, momentarily, by way of its decisions, reveals its present state;
3. One of the great questions with respect to judicial decisions is linked to the absence of approach by temporality in the argumentation elaborated by jurists. They make the safe pretense their objective. It is rare to observe interpretations based on probability/improbability with temporally valid decisions;

4. Under the temporal perspective, therefore, the juridical system does not possess positivist rationality. It finds itself in the multiplication of possibilities for widening margins for decisions included in the question of time.

Returning to the second type of temporalization, the temporalization of complexity, there is a problem of immunizing the judicial system: to reduce the complexity of its surroundings in a way that constructs its own complexity, in a movement that unites normative closure to structural coupling.

Therefore, the use of algorithms in Law's futurization appears in quite a clear way in the characteristics of the juridical system: (a) in the self-organization when, for example, it establishes communications that guide decision-making processes in virtual trials; (b) in self-reproduction, when the decision taken based on algorithms is capable of transforming itself into jurisprudence and, in this way, influence other decisions and (c) in self-recursion, when the set of operations of the judicial system absorbs and reprocesses algorithms in their function of maintenance of normative expectations.

Under this perspective, setting out from the established distinctions, beginning at the basic level (system x environment), the problem of the futurization of Law is inserted into the structures of (algo)normative structures related to Law itself. Said in another way: Law constructs its temporality. This temporality, in turn, is reflexive and, therefore, observes itself or its changeable/unchangeable character or its innovative/non-innovative distinction. And all this movement, in the current complex society, is realized in the partnership of algorithms that communicate in an artificial way.

Esposito (2022, 104) states that the challenge for contemporary society is "to combine individual algorithm forecasting with the openness of the future". A paradoxical reach towards what is foreseeable before the unseeable, since the algorithms possess quite a clear temporal condition: to foresee the future. They select future information. They seek to know about what information will be necessary in the wake of the entanglement of existing communication. Algorithms turn future uncertainty into a "certainty".

At the crossroads where the selection of information and the temporal control by Law meet, one also finds the algonormative expectation. Juridical communication is present throughout the social system and, as has been demonstrated, is temporally guided towards the control of the future. Algorithms and their selection of information to forecast the future also have an influence on the futurization of Law. The function of the system of Law also comes to include the maintenance of algonormative expectations. As technical as these controls may be, though, algorithmic predictions are also not prohibited from being wrong.

It is in this way that algorithms modify the future of normative expression. The last question related to the existence of normative expectations receives an affirmative response.

4. Final considerations: A concept for algonormative expectations

The study sought to demonstrate that algorithms influence normative expectations in a way that includes them, in contemporary society and in stabilizing normative expectations. After sifting through Luhmannian theory and observing that the works of Elena Esposito and Hakan Hydén could contribute to the objective in a joint way, it was

possible to develop a concept for algonormative expectations as described in this conclusion.

Within the scope of this article, a*lgonormative expectations* carry the meaning of a double contingency originating in virtual communication, based on algorithms, having occurrence between a non-human collaborator and a psychic system, thereby influencing the way in which such players condition their expectations in relation to the juridical system and, also, how they accept their decisions in a determined social context.

With this concept, it is possible to confront the complexity of the current judicial system without ceasing to understand it as a social system functionally differentiated from the global social system. In this sense, the quality of self-referencing by Law presents itself as a natural result of its potentiality to perturb social systems and, then, possesses an absolutely dynamic nature which, in a certain way, as approached in the article, presents a problem that is quite clear but legally static.

In this way, if the system of Law alongside psychic systems is already routinely affected by algorithms based in artificial intelligence, even if it is not possible to perform such an observation, the same is the case for normative expectations. Once again taking on a central point from Luhmann's social systems theory, to understand the improbability of communication means being immersed in a social construction given from these same communications. When such communication is artificial, algorithms based on artificial intelligence will (re)duplicate their contingency.

Therefore, upon combining the concept of *algo norms* by Hydén with Luhmann's theoretical structure about normative expectations, alongside Esposito's idea of artificial communication, it becomes clear that the algorithms utilized in the internal operativity of Law possess social consequences. In that which concerns Luhmannian thought, by way of the mechanisms that are operationally closed, and by the cognitive opening of systems, Law equally finds its influence in algorithms as much as it selects and (re)processes such an influence, returning it to the environment – the environment of the rest of the systems – through (juridical) communication. This communication, in turn, will be selected and internally treated by each one of the social subsystems that, also, will provide communication to the environment that is diverse and its very own communication.

Algonormative expectations constitute themselves as something new for legal professions and for the judicial system. As long as one believes that the system of Law can preserve its autonomy, being able to take on new social modifications such as algonormative expectations, at the very least great possibilities will present themselves as objects of study for the Sociology of Law.

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